

## Is a flap procedure necessary for every pilonidal sinus case?

Flap procedure in pilonidal sinus

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### Abstract

**Aim:** Pilonidal sinus is a common disorder of the intergluteal sulcus with several options for treatment. This study aims to compare the primary closure method with the Limberg flap procedure regarding the recurrence rate and complications. **Material and Method:** The sample was made up of patients who were admitted to the General Surgery Department of the Adnan Menderes University Medical Faculty between September 2014 and September 2016 with the diagnosis of pilonidal sinus disease and underwent either primary excision or Limberg flap procedure. The recurrence rates and complications of both methods were compared. **Results:** The study includes a total of 123 patients. Sixty-three (51.2%) of the subjects underwent the primary excision surgery, and 60 (48.8%) underwent the Limberg flap procedure. Complications were observed in 13 (21.6%) of the 63 patients in whom primary excision was performed and in 6 (10%) of the patients who had undergone a Limberg flap procedure. A recurrence was observed in a total of 8 patients, in 6 of whom (75%) a primary excision was performed, and in 2 (25%), the Limberg flap procedure was used. There was a statistically significant difference between the two patient groups regarding their recurrence and complication rates ( $p = 0.042$ ). **Discussion:** In pilonidal sinus disorder, the flap procedure has a better outcome compared to the primary closure method regarding the recurrence and complication rates.

### Keywords

Pilonidal Sinus; Limberg Flap; Primary Closure

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**Introduction**

The pilonidal sinus disease is a common inflammatory disorder of the gluteal region with a prevalence of 26/100.000 [1]. It is more common in males aged 20-30 [2]. The recurrence rate following treatment is reported to be about 40% [3, 4]. There are several treatment methods including open wound healing, primary closure, and various flap techniques. The literature reports the recurrence rates to be 30% for primary closure and 17% for open wound healing [5]. There are many flap techniques such as Karydakis, Limberg, Bascom, and Rhomboid methods and it is reported that this rate can drop down to 3% when such flap methods are meticulously used [2]. While the number of studies investigating the relationship between operative methods and postoperative complications is limited it has been suggested that to avoid complications such as wound infection, seroma, or hematoma, the surgeon should properly drain the wound without leaving any sequestered spaces, properly maintaining the oxygenation of the operative site [6].

In this study, we planned to compare the primary closure method and Limberg flap procedure in patients on whom we performed pilonidal sinus surgery, regarding their recurrence and complication rates.

**Material and Method**

This study was retrospectively designed, and the patients who were admitted to the General Surgery Department of the Adnan Menderes University Medical Faculty between September 2014 and September 2016 and operated with the diagnosis of pilonidal sinus were included. The researchers obtained the written informed consents from the patients who were included in the study. The patients were divided into two groups: the patients who had undergone primary closure (Group 1) and who had undergone the Limberg flap procedure (Group 2). The patients were monitored until November 2016. Both groups had received 1 gr ampicillin – sulbactam for antibiotic prophylaxis. A Hemovac drain was used in patients in the Limberg flap group, which was retrieved when the volume of the drainage fluid was below 30 ccs. No drainage was used in patients in the primary closure group. The wound dressings of the patients were changed daily. The patients’ demographic data, recurrence rates, complications, and types of treatment methods were recorded, and the two groups were statistically compared.

**Statistical Analysis**

The obtained data were analyzed using a statistics program (SPSS, Version 17, Chicago IL, USA). The study included the descriptive statistics for the categorical and continuous variables (mean and standard deviation, median value, minimum, maximum, number, and percentages). The Levene’s test was used to determine the homogeneity of the variances as a precondition for parametric tests. The normality hypothesis was tested with the Shapiro – Wilk test. The differences between the two groups were evaluated using two types of tests as follows: the Student’s t-test was used when the variable met the preconditions of the parametric test, and the Mann – Whitney U-test when it did not. The relationships among the categorical variables were analyzed using Fisher’s exact and Chi-square tests. The Monte Carlo Simulation Method was used to include variables

the frequencies of which were <20%.  $p < 0.05$  was considered as statistically significant.

**Results**

The study included 123 patients, 102 of whom were male (82.9%) and 21 were female (17.1%). The mean age was 27.15(15-38) years. Sixty-three (51.2%) of the subjects underwent the primary closure operation, and 60 (48.8%) underwent the Limberg flap procedure. The mean BMI (body mass index) was 23.69 in the Limberg flap group, and 24.06 in the primary closure patient group ( $p = 0.427$ ). Complications were observed in 13 (21.6%) patients in whom primary closure was made and in 6 (10%) patients who had undergone the Limberg flap procedure. A recurrence was observed in a total of 8 patients, in 6 of whom (75%) a primary closure was performed, and in 2 (25%), the Limberg flap procedure was used. It was observed that seroma developed in a total of 5 patients of whom 3 were in the primary closure group (60%) and 2 were in the Limberg flap group (40%). Wound dehiscence was present in 6 patients, 4 (66.6%) of whom were primary closure patients, and 2 (33.4%) had undergone a Limberg flap procedure ( $p = 0.042$ ) (Tables 1 and 2).

Table 1. The relationships of age and BMI with surgery

Surgery Type	N	Mean	Std. Deviation	Std. Error Mean	p
Age Flap	60	26,40	10,33	1,33	0,341
Primary Excision	63	28,16	10,08	1,27	
BMI Flap	60	23,69	2,62	0,34	0,427
Primary Excision	63	24,06	2,56	0,32	

Table 2. The relationship between complications and surgery

Flap Primary Excision	Surgery Type	Total	p
Gender	Female	n 11 10 21 % 18,3% 15,9% 17,1%	0,712
	Male	n 49 53 102 % 81,7% 84,1% 82,9%	
	Total %	n 60 63 123 100,0% 100,0% 100,0%	
	Recurrence	n 2 6 8 % 33,3% 46,2% 42,1%	
Complication	Seroma	n 2 3 5 % 33,3% 23,1% 26,3%	0,042*
	Surgical wound dehiscence	n 2 4 6 % 33,3% 30,8% 31,6%	
	Total %	n 6 13 19 100,0% 100,0% 100,0%	

\* $p \leq 0,05$  was considered as statistically significant

**Discussion**

Sacrococcygeal pilonidal disease can be defined as a disorder that originates from the congenital natal cleft and drains spontaneously to the subcutaneous spaces from there [7]. Its definitive treatment is surgery, and there are numerous surgical methods [8,9]. The Limberg flap procedure is one of the flap techniques. Lebo et al. [10] in their study comparing the

Limberg flap procedure with open-wound treatment technique, determined that both techniques had their advantages and disadvantages; however, the healing period was shorter in the Limberg flap method when compared to the open-wound treatment. Research to find an ideal treatment method for the pilonidal sinus disease is still ongoing. The important point to achieve success is suggested as shifting the midline, in other words, the intergluteal sulcus laterally and closed without tension and that any treatment enabling this would be appropriate [11]. Sevinç et al. [11] in their randomized prospective study with 150 patients, compared the Limberg flap, Karydakis technique, and primary closure method. They determined that the primary closure technique, in which the midline is shifted without tension, is an effective, easy, and rapid method. Our study, which compared the Limberg flap technique and the primary closure method, reached different results, and the Limberg flap was more successful when compared to primary closure method. This suggests that a consensus regarding the treatment of pilonidal sinus has not still been reached and that the results can be affected by various factors such as the clinical experience and the number of subjects.

The ideal treatment of the pilonidal sinus disease should be described as a method which is easy to perform, with low recurrence and complication rates, less severity of pain, with less duration of procedure and hospitalization, together with a short recovery period [12]. Arslan et al. [13] followed-up 33 patients who had undergone the Karydakis procedure and reported the recurrence rate as 11%. There are several studies reporting similar results for the Karydakis flap [14]. Our study determined the recurrence rates of 9.52% for the primary closure patients and 3.33% for the Limberg flap patients. We believe that such low recurrence rates are a result of our short average follow-up duration and that some patients might have been overlooked due to the retrospective nature of our study. However, the recurrence rate of the Limberg flap group was still significantly lower than the primary closure group.

One of the most common problems faced following primary excision of the pilonidal sinus and closure is the wound dehiscence due to tension occurring in the wound site [15, 16]. In our study, a total of 6 patients experienced a dehisced wound, 66.6% of whom were in the primary closure group, and 33.4% were in the Limberg flap group. In addition, although numerous studies have equivocally indicated that complications such as seroma due to tension and sequestered spaces, pain, hematoma had higher rates in the primary excision method, in some studies they were not superior to each other [16, 17]. Our study determined that, for all types of complications (seroma, wound dehiscence, recurrence, etc.), the Limberg flap group was superior to the primary closure group, as it had fewer complications.

To conclude, the ideal method for treatment of pilonidal sinus disease has still not been determined; however, as several studies have reported, choosing the appropriate flap method usually provides better results than primary closure regarding complications and recurrence rates.

#### Scientific Responsibility Statement

*The authors declare that they are responsible for the article's scientific content including study design, data collection, analy-*

*sis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.*

#### Animal and human rights statement

*All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.*

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#### Conflict of interest

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